U.S. Department of Transportation

Federal Aviation Administration

Advisory Circular

Subject: AIRCRAFT FIRE AND RESCUE COMMUNICATIONS	**Date:** 4/30/84 **Initiated by:** AAS-100	**AC No:** 150/5210-7B **Change:**

1. **PURPOSE.** This advisory circular (AC) provides guidance for planning and implementing an airport communications system for airport fire and rescue service.

2. **FOCUS.** The prompt and efficient response of a modern rescue and firefighting service depends on the reliability of its communication and alarm system. In addition, the effectiveness of related mutual aid operations at an airport depends on the adequacy of the system for alerting and communicating with participating personnel. The reliability of such a system is crucial. Therefore, in those cases where the basic utility of the communications system is at stake, the imperative word "must" has been used in place of the advisory "should." There is no intent to change the nature of the guidance from that of the customary recommended practice. The intent is only to emphasize certain key elements that are essential to the successful implementation of a cost-effective airport fire and rescue service communications system.

3. **CANCELLATION.** Advisory Circular 150/5210-7A, Aircraft Fire and Rescue Communications, dated March 16, 1972, is cancelled.

4. **OVERVIEW OF AIRPORT EMERGENCY COMMUNICATIONS.**

   a. **Objectives.**

      (1) The management objective should be to provide cost-effective airport fire and rescue service communications capability that is consistent with the airport's operational needs.

      (2) The operational objective should be to provide a primary and, where necessary, an alternate effective means for direct communications between the following, as applicable:

         (i) The alerting authority (Federal Aviation Administration (FAA) control tower or flight service station, airport manager, fixed-base operator, or airline office) and the airport fire and rescue service.

         (ii) Air traffic control tower or flight service station and the rescue and firefighting crew enroute to an aircraft emergency or at the accident/incident site.

(iii) The fire alarm room and rescue and firefighting vehicles at the accident/incident site.

(iv) The airport fire and rescue service and appropriate mutual aid organizations located on or off the airport, including an alert procedure for all auxiliary personnel expected to participate.

(v) Each rescue and firefighting vehicle, to include a link between crew members on the same rescue and firefighting vehicle where operationally necesary.

b. Major Components. An airport firefighting and rescue services communication system normally includes a two-way voice radio, direct-line telephones, and audible alarms located in strategic places.

c. Alternative Procedures.

(1) At those locations where the primary alerting authority (such as a control tower) is not operational during all the hours that the airport is open to aircraft traffic, a secondary alerting authority must be designated and trained. Appropriate communications and alarm control devices must be available at the secondary alerting authority's operating location, and they must be operational during all times that the primary alerting authority is not available.

(2) At those locations where a city, town, or county off-airport fire department furnishes the airport firefighting and rescue personnel and the alerting/dispatch of those personnel for airport emergencies is handled by an emergency direct-line telephone between the airport alerting authority and the off-airport alarm room, the airport fire station alarm(s) should ring upon activation of the direct emergency line. If possible, however, this type of "third party" dispatching of airport firefighting and rescue services should be avoided.

5. METHODS OF IMPLEMENTATION.

a. Alert Enhancement. Because the majority of the calls for aircraft firefighting and rescue services are initiated by or first received by air traffic controllers, the airport fire department alarm room should be linked by two-way radio and direct-line telephone to the control tower, the flight service station, or other air traffic point. To enhance the response time of the fire and rescue crews:

(1) The emergency direct-line telephone should not pass through any intermediate automated switchboard or operator that could subject the alert calls to delays.

(2) The tone of the emergency telephone bell (or buzzer) should be distinctly different from all other communications signaling devices within hearing of personnel in the alarm room, on the apparatus floor or in living quarters, as applicable.

(3) Protection against delays due to telephone bell-buzzer failure should be provided by use of redundant warning lights activated by the same input signal as the telephone ringer. The lights should be strategically located throughout the

alarm room, the apparatus floor and living space, as dictated by the fire house design, and the normal activities of the fire and rescue service personnel.

(4) The firehouse alarm bells should be linked to the telephone ringer so that a call on the emergency telephone circuit simultaneously activates the audible alarm throughout the firehouse.

(5) The alarm circuity should activate an automatic door opening device for the vehicle doors in the fire station upon sounding the alarm. Some climatic conditions may make this technique impractical.

b. Multiunit Notification. The notification of all units required to respond to an aircraft emergency at a large airport can be expedited by the use of a "conference" circuit. Such an arrangement allows simultaneous notification. This "conference" circuit should, as appropriate, include:

(1) Control tower, flight service station, or other control point;

(2) Fire and rescue service;

(3) Airport police;

(4) Airport management, (operations and maintenance);

(5) Airline station managers as appropriate;

(6) Military units (joint-use airports), and

(7) Other authorities on or off the airport as required by the airport's Emergency Plan.

At airports with several air carriers, the notification of the appropriate airline station manager may be accomplished more effectively by the use of individual paging devices.

c. Notification of Firefighters.

(1) Firehouses in which personnel are normally present for duty but may be preoccupied with "housekeeping" or training duties should be equipped with a public address (PA) system. This is particularly important in firehouses where the alarm room, training room, and living quarters are physically separated from the apparatus floor. A PA system can significantly enhance response time and firefighter effectiveness by providing vital details of the emergency to the firefighters during turnout, e.g., location of accident or incident site, type of aircraft, number of persons involved, aircraft fuel load, preferred vehicle routing, etc.

(2) At airports with a main fire house and one or more substations, an interconnected PA system is an operational necessity.

d. Notification of Dual Function Personnel. At airports employing dual function personnel or auxiliary firefighters, an audible alarm should be installed in all areas where auxiliary firefighting personnel are employed to notify them of an

emergency recall for fire and rescue duties. This alarm should have a distinctly different sound and it should be loud enough to be clearly heard above the normal noise level.

(1) At airports equipped with ground-to-air radio, the person authorized to receive in-flight emergency messages should be provided with a device for activating these·alarms.

(2) At airports not equipped with ground-to-air radio or a formal fire service alarm room, alarm activation stations should be provided near hangars, shops, fueling stations, and aircraft parking areas where vision of the operational runway is unobstructed, i.e., where service and maintenance personnel normally work, thereby allowing them to quickly activate an alarm upon seeing a need in the operational area for aircraft fire and rescue service.

(3) Individual paging devices, although potentially more expensive, may be used for the same purpose. This method has the advantage of notifying only those persons with assigned fire-rescue duties--thereby giving them an edge over the well-meaning but often troublesome curiosity seekers that are otherwise attracted a public attached to the public alarm system. At new or expanding airports where other devices are not already installed, this method may also prove to be more cost-effective and operationally more flexible.

e. <u>Notification of Mutual Aid Units.</u> A reliable voice communications capability should be available between the airport fire and rescue service and any off-airport organizations expected to participate in the airport-community mutual aid plan.

f. <u>Emergency Response Vehicles.</u> Each emergency response vehicle at an airport should be equipped with two-way voice radio communication linking it with the alerting authority, all other aircraft fire and rescue vehicles, and the designated command post.

(1) On airports with a control tower, the communications channel between vehicles and the tower should be on the assigned standard ground control frequency, or as designated in Airport Emergency Plan Letter of Agreement between airport management, control tower or flight service station.

(2) On airports without a control tower but having another means of ground-to-air communications, the fire and rescue vehicles should be equipped to communicate on a frequency common with the control point.

(3) Where possible, the two-way radio capability on the airport fire and rescue service vehicles should <u>not</u> be "tied into" public service frequencies--city-country or airport maintenance. An independent communications network will help ensure interruption-free communication during emergency situations.

g. <u>Command and Control.</u>

(1) On scene commanders (OSC) require a communication capability while outside or remote from their vehicle communication system. Walkie-talkie type units may be used by the OSC for direct contact with the airport fire service frequency or air traffic control personnel.

(2) The large size of today's aircraft inhibits the pilot's ability to observe the activities of rescue personnel or the exterior of the aircraft. Without this ability, it is difficult to make command decisions regarding the safety of passengers and crew. Hence, a reliable form of communication between the aircraft commander, the OSC, and the airport alerting authority is needed to preclude unnecessary aircraft emergency evacuation or misunderstandings regarding procedures and techniques being employed by the airport fire and rescue service.

(3) Direct communications may be established between the pilot (or the aircraft cockpit) and the OSC or other fire and rescue personnel by use of cockpit-to-ground lines. This requires a proper connector, wire, mircrophone, and headset. Cooperation and coordination between the airport fire and rescue service and the individual air carrier is needed to establish this type of communication link. Normally, this communication is created when a ground service headset is plugged into a wheelwell interphone jack.

6. ALARM ROOM EFFECTIVENESS. The airport fire and rescue service alarm room must be designed and operated in such a manner that an aircraft's request for assistance can be received, evaluated, and acted upon with a minimum of activity or consultation.

  a. Operational Reliability.

(1) For an alarm room to serve its intended function, provisions must be made to assure that all related emergency communication equipment is tested daily and is properly maintained. In addition, all personnel assigned to alarm room duties must be trained in communication equipment operations, proper communication procedures, and local emergency plan implementation procedures.

(2) To assure that the communication system is operational under a variety of airport emergency conditions, provisions must be made for an emergency standby power source.

  b. Planning. As an airport grows and its aircraft traffic increases, the airport's fire and rescue service expands and becomes more complex. Historically, the aircraft fire and rescue service alarm room frequently evolves into an airport emergency command center. Hence, long-range planning for this growth is necessary to prevent the alarm room from becoming overloaded with alarms, switches, buzzers, colored lights, assorted telephones and radios, PA systems, recall rosters, operations manuals, disaster plans and personnel.

7. HOW TO OBTAIN THIS PUBLICATION. Additional copies of this AC may be requested from U.S. Department of Transportation, Publications Section, M-494.3, Washington, D.C. 20590.

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